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ABSTRACT

The purpose of this study was to examine the effectiveness of using an electronic bulletin board in an off-campus doctoral program (Ed.D.) for health professionals offered by the University of Georgia. Participants included 14 doctoral students (13 female and 1 male) enrolled in an advanced course, Research in Instruction, who received training in the use of the Remote Bulletin Board System for the IBM Personal Computer (RBNS-PC) during their second class meeting of the fall quarter, 1985. Students were also provided with an 11-page description of the program, which included instructions for its operation, and informed that use of the bulletin board was voluntary. Data were collected at the end of the quarter via two methods: a consent form, signed by each student, which clearly explained the study's intentions; and the Stages of Concern Questionnaire (SoCQ) developed by Hall, George, and Rutherford (1979). Analysis of the data indicates that only half the students signed on the bulletin board during the fall quarter; however, most students were preparing for their preliminary oral and written examinations and viewed the bulletin board as adjunctive or unnecessary at that moment. Students reported a variety of problems encountered in using the bulletin board, but most indicated it should be continued and stated that they expected to use it more frequently during the next quarter. The conclusion suggests topics for future investigation, and two references are appended. (JB)

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Feasibility Study of Bulletin Board and Electronic Mail Technologies for the Improvement of Student/Instructor Communications Used in "Distant" Education Course Offerings

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INTRODUCTION

What is the problem?

Responding to direction from the Board of Regents, the College of Education at the University of Georgia has entered into several cooperative programs to offer advanced graduate degree programs in the south Georgia area. While these programs are meeting very real needs for students in that area, they are causing more than ordinary time demands of the UGA professional staff. Any technology that can reduce this nonproductive use of the instructor's time while maintaining or increasing the interaction between instructor and students warrants further study and investigation.

What is the specific context of the problem?

Since the spring of 1982, the College of Education at the University of Georgia has operated a doctoral program for health professionals on the campus of Armstrong State College in Savannah, Georgia. The program, which allows students to pursue the Doctorate in Education (Ed.D.) in the areas of curriulum or instructional development, was designed especially for health professionals who are involved in education or training.

The opportunity to receive their doctoral instruction at the local campus gives students several unique advantages. First, they avoid the turmoil, both to their careers and to their families, of relocating in Athens. They continue with their present jobs, attending class during late afternoon and night. Second, they avoid the expense of moving to another town and of losing the income from their present jobs. Third, they have the singular opportunity to apply what they are learning immediately to their jobs.

Operating a doctoral program so far away from the UGA campus in Athens, however, poses special problems for faculty and students. For the faculty, the most obvious problem is travel. By car, travel from Athens to Savannah requires about four and a half hours. Since classes begin in the late afternoon, faculty must stay overnight. So a class in Savannah requires UGA faculty to spend two workdays away from campus. In addition to the problem of physical distance, faculty must cope with the reduced opportunity to work and communicate with students. The College of Education and its faculty, then, face several problems: increased expenses due to faculty travel, loss of productive faculty time in travel, and reduced opportunities to interact with students.

Students also encounter problems in pursuing their doctoral studies away from the UGA campus. Library resources are not always readily at hand, nor is the friendly advice and presence of other doctoral students familiar with the program and with the professors who teach in it. The faculty themselves are encountered one at a time with little opportunity for additional contact during the week.

What is the purpose of this study?

The purpose of this study was to examine the process of introducing, maintaining, and using an innovation, the electronic bulletin board, within the off-campus doctoral program at Armstrong State College. In particular, we wanted to conduct the study within a specific classroom setting, addressing several questions:

1. What are the students' current levels of experience with computers?

2. Will they voluntarily choose to use the electronic bulletin board?

3. How do they evaluate its effectiveness?

4. How do we evaluate its effectiveness?

5. What modifications can we make to improve its continued use?

METHOD

Who were the participants?

Fourteen doctoral students enrolled in an advanced course, Research in Instruction, participated in this study. Students were employed, primarily as educators, in the health fields such as nursing, dental hygiene, and radiological technology. They have been enrolled in this program for approximately four years and have taken, for the most part, the same sequence of course work. The group consisted of thirteen females and one male, and ranged in age from 30 to 52.

What was the context of the study?

A doctoral program of study involves several distinct phases: (a) taking course work; (b) passing preliminary written and oral exams; (c) developing a dissertation prospectus; (d) conducting the study; (e) writing up the results; and (f) obtaining approval of the dissertation via a reading committee and final oral exam. Students in this study were at level (b) the quarter during which the electronic bulletin board was introduced. They were anticipating standing the written and oral preliminary exams. In other words, they were moving from the familiar pattern of taking courses to the unfamiliar and anxiety producing stage of the preliminary exams. In short, the electronic bulletin board was introduced at a very stressful time for the students.

Second, the course being offered (Research in Instruction) did not follow the typical pattern of students receiving instruction each week, taking quizzes, preparing papers, and so forth. Rather, this course allowed each student to work independently to prepare for the preliminary exams. A different type of instructional strategy, then, was needed. Communication between students and faculty, rather than formal study, was required.

Third, the use of the bulletin board was voluntary. It was presented as a useful tool for facilitating communications between students and faculty. No one was required, for example, to sign on or post a specified number of messages.

Fourth, as one might expect, some students were familiar with using personal computers, others were not. Some students owned personal computers, modems, and communication software, others did not. This information will be described later.

What did we do?

We conducted two major activities: installed and monitored the electronic bulletin board and provided a training session on the use of the system. Each of these activities is described below.

Installation and Monitoring

A Tandy 1200 (640K and a 10 megabyte hard disk) was installed in the Armstrong Department of Nursing, connecting the computer via modem to one of the departmental phone lines. We had previously tested the operation of this computer by running a campus bulletin board on it for a two-week period.

The software package used was the Remote Bulletin Board System for the IBM Personal Computer or, as it is more commonly known, the RBBS-PC. This program was developed and still maintained by the Capitol PC User Group in Gaithersburg, Maryland. The RBBS-PC package is copywrited but is available at no cost. For a modest contribution of twenty-five dollars to the Capitol PC User Group, a user will be registered and notified of further improvements in the package.

The major features of the RBBS-PC are a message system, a bulletin system, and a filing system. The message systems allows 250 active messages, which may be private or available to anyone. The bulletin system is operated only by the system operator and contains announcements or other information that is permanently posted. The filing system allows the uploading and downloading of text documents or programs. RBBS-PC also has an option for assigning different levels of security for users, which increase or decrease the user's access to the entire package.

A special program was written to initialize the RBBS program immediately when the computer was turned on so with the flip of a switch the system was ready for use. The system initialized and was then ready. The board operated from 5:00 PM to 9:00 AM weekdays and 24 hours a day on weekends.

The logic of placing the host computer in Savannah was that it required only local calls for students. We would call long distance on GIST from Athens, thereby assuming the major phone expense. The system, then, had to be monitored remotely from Athens, which was a disadvantage to the system operator.

Training Session

A two-hour training session was held during the second class meeting of fall quarter, 1985, on the same day that the computer was installed. Students met one of our two systems operators, a graduate student enrolled in the on-campus program in instructional development, who then demonstrated the major features of the RBBS package. An eleven-page description of the program was distributed. Major topics included signing on, the help file, reading messages, leaving a message, the utilities menu, the files system.

At the time the training session was conducted, an informal survey of students indicated that seven out of the eleven present owned a personal computer. Five students owned modems and communications software; four had placed calls to an electronic bulletin board or electronic mail service. We made arrangements for a TRS Model 100 computer, an inexpensive yet adequate computer with a built-in modem, to be made available for each student who did not own or have access to a computer.

What data did we collect?

Students knew generally that we would collect data at the end of the quarter on the operation of the system and on their reactions to this experience. Upon further reflection, however, we concluded that this informal approach was unfair to the students. They should know very specifically what data we would collect, how it would be collected, who would do it, and what use would be made of the data. We therefore developed a consent form that clearly explained our intentions. Two major items from this form are given below.

> The following points have been explained to me:
>
> 1) The reason for the research is to assess the feasibility and effectiveness of the electronic bulletin board as a communication tool in our off-campus doctoral program. The advantages that I may expect from it are: (a) insures that specific problems you may encounter when using the bulletin board are addressed, (b) provides a systematic record of your reactions to the bulletin board, (c) insures effective use of the board with future classes, (d) models action research dealing with use and acceptance of an innovation.
>
> 2) The procedures are as follows: (a) You will be asked, via interviews and/or self-report, to describe your level of use of the bulletin board, problems you encountered, and conditions that would make it a more effective communication tool. This information will be collected once each quarter. (b) You will also be asked, via a questionnaire, to share your concerns about this innovation. For example, -Do you need more information about it? Would you prefer to use a different way of communicating? This information will be collected once each quarter. (c) Data will be collected over a three quarter period. (d) Statistics on use and operation of the board will be kept. In no circumstance, however, will the content of a message be a part of this study. Your messages will receive the level of security that you assign and will not be seen by anyone other than the person or persons you designate and the systems operator.

Students read the consent form, asked for a few clarifications, and then all eleven present at the last class meeting signed the consent forms.

As item 2 in the consent form shows, three types of information were obtained: (a) self-report about their level of use of and reactions to the bulletin board; (b) response to a questionnaire about their concerns about the bulletin board; and (c) statistics on the use of the bulletin board, which came directly from the RBBS program.

The self-report form consisted of nine items requesting such information as "3. Did you have any problem(s) in using the Bulletin Board?" and "6. Should the Bulletin Board be continued next quarter?"

The Stages of Concern Questionnaire (SoCQ) developed by Hall, George, and Rutherford (1979) was the questionnaire used to measure students' concerns about the bulletin board as an instructional innovation. Hall et al. make two major assumptions about the individual adopter: first, that individuals move through seven stages of concern about the innovation, and second, that the intensity of concerns varies from stage to stage. For example, a person who is a "non-user" of an innovation would have

a different profile of concerns than a "user." Moreover, the non-user profile would change as that individual becomes an experienced user.

Broyles and Tillman (1985, p. 366) described the seven specific stages of the SoCQ as follows:

0	Awareness	Little concern or involvement with the project.
1	Informational	Need for general information.
2	Personal	Uncertainty about her/his role in the project.
3	Management	Attention to the processes and task of using the project.
4	Consequence	Focus on the impact of the project on the learner.
5	Collaboration	Focus on coordination and cooperation with others regarding the project.
6	Refocusing	Exploration of alternative uses of the project or a replacement.

What did we find?

In reviewing the findings presented below, several important features of this study should be kept in mind. First, the introduction of the bulletin board came at a very stressful time for students, taking preliminary written and oral examinations. While students generally welcomed it as a useful tool, it was clearly adjunctive or, for a few students, unnecessary at that moment. Second, the use of the bulletin board was purely voluntary. No minimum number of sign-on's were required. Third, at the time the host computer was installed, only five students had the necessary hardware to link up with the system. Although we would have preferred that all students have the necessary equipment at the start of the quarter, this could not be achieved without delaying the installation of the host computer. By the end of the quarter, most students did have access to the bulletin board. In several cases, the availability of the board prompted students to purchase their own personal computers.

Findings are presented in four sections: summary of RBBS usage, self-report results, responses to the SoCQ, and initial costs.

Summary of RBBS Usage

The number of times each user signed on the RBBS over a ten week period from October to December can be summarized as follows:

Person	Number of times signed on
Sysop 1	15
Sysop 2	11
Instructor	13
Student 1	41
Student 2	11
Student 3	10
Student 4	5
Student 5	2
Student 6	1
Student 7	1
Others	5

These data show very clearly that only half of the students signed on the bulletin board during fall quarter. "Others" were callers who were checking out the new board. No files were uploaded or downloaded.

Self-Report Results

A survey of RBBS usage was given during the last class meeting. Eleven of the fourteen students were present. Of those eleven, six had used the board and five had not. When asked "Why did you not use the board?" four replied "lack of equipment" and one "didn't know how." Three of the four who lacked equipment also mentioned that they did not need the board that quarter.

Of those who used the board, a variety of problems were encountered: (1) one student was tagged with a security violation and access was then withheld (apparently the student repeated an incorrect command three times so the RBBS program decided a criminal was at work); (2) several attempts to upload and download files were unsuccessful; (3) use of nicknames in addressing messages would result in undelivered messages; (4) a user would be knocked off the board automatically after two minutes of inactivity; (5) occassionally, the computer would not be turned on at 5:00.

Also from those who used the board, several suggestions for improvement in the system were obtained: (1) increase access time by having a separate phone line; (2) train other University of Georgia faculty in the use of the board; and (3) post more information of general interest to all.

And finally, students were asked two specific questions: (1) "How frequently do you plan to use the board next quarter?" Eight replied "more than this quarter" and two "about the same." (2) "Should the board be continued next quarter?" Ten replied "yes"; one record was incomplete.

Responses to the Stages of Concern Questionnaire (SoCQ)

Eleven students completed the SoCQ. For each record, raw scores for the seven stages were converted to percentiles, then plotted. Two groups of student records were formed. One consisted of the three most frequent users of the bulletin board. The other consisted of five students who did not use the board. Profiles of these groups were averaged, plotted, and then compared. The resulting profiles conform to the predictions of the concerns model: the nonuser group of five showed very high intensity of concerns in the first three stages (awareness, informational, and

personal) with less intense concerns for the four remaining stages. Their concerns, then, were in obtaining more information and in determining how they might use the bulletin board; they were not concerned about collaborating with colleagues about the bulletin board. The user group, however, showed a different pattern of concerns: lower awareness, informational, and personal but much higher on collaboration. This user group had yet to show concerns for refocusing, which the concerns model would predict for experienced users. In short, concerns theory appeared to describe quite well the two user groups that we formed.

Our primary use of this data, however, was to develop an appropriate intervention for each student based on his or her unique profile. These data will also be shared with students. The SoCQ will also be given at the end of winter and spring quarters.

Initial Costs

Our original projection for equipment called for a budget of $9,600, which included one Tandy model 1200 with accessories, ten model 100 portable computers, and one printer. Our actual equipment expenses, however, were these:

1	Tandy 1200 HD with monitor, graphics adapter, and cables	$2,295
1	Modem	350
3	Model 100 (24K) with cables, carrying cases, and AC adaptor	1,555
	Total	$4,200

The system operator's salary for the quarter would add an additional $1,000 to this total (10 hours per week at $10 per hour for 10 weeks) as well as the GIST phone calls to Savannah, estimated at $150 (GIST does not provide actual cost billing). The total expenses then add up to $5,350. This figure does not reflect any equipment costs from the Athens end. We already had the needed equipment. Additional improvements, such as a printer in Savannah and a dedicated phone line, will of course increase this figure.

We did not project any sort of cost benefit ratios since most of this quarter was devoted to installing the system. With additional experience in operating the system, we will examine carefully this important dimension.

Where do we go from here?

Our initial view of establishing a bulletin board focused on equipment, budget, and logistical problems. And indeed, it took virtually the entire quarter to develop an operational system, including installation and monitoring the system, training students in its use, and procuring equipment so students can have access to the system. On this score, we have simply just begun. We have an operational system, but one that is not functioning well for all its potential users. Only half of the students have actually used the system.

After ten weeks of operation, however, we have become more aware of the student's view of the system. Some students, for example, need additional practice in using the basic system. Yet others, want to share information about the bulletin

board with colleagues and locate and use additional bulletin boards in their specialty areas. Also, more linkages, for example, need to be made between Armstrong State students and University of Georgia faculty and students.

We are encouraged that the students themselves, those who have used the system and those who have not, strongly support the continued operation of the bulletin board. Both they and we remain optimistic that a significant new communication tool is being forged.

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